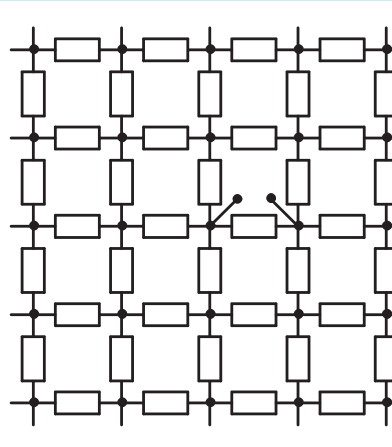
QUIZZ'

Professor Martin Ohsmann

Martin Ohsmann was born in 1959 and as the photograph shows, got the hang of 'all things electric' (including hammers) at a very early age. Martin read electrical engineering at Technical University Aachen (RWTH), Germany, graduating in 1984. He became a staff member of the RWTH Mathematics Faculty (dissertation 1988), development engineer, scientific staff member of Philips Research Labs in Aachen. Since 1999 Martin is a Professor of Electrical Engineering and Information Technology at FH Aachen, lecturing in Operating Systems and Distributed Systems.

Martin Ohsmann has been reading the German version of Elektor since 1972. His first contribution to the magazine was an article on RDS decoding using a PC; this was published in 1989.

Many of you will have substantial amounts of identical resistors lying around, perhaps bought years ago as a 'super pack' or some other 'scoop' offer. To practice the noble art of soldering, dozens of these components may be soldered together to form a square grid array (**Figure 1**). Supposing you had an infinite number of resistors available, the array, too, would be infinite. This month we kick off our Quizz'away series with this problem:



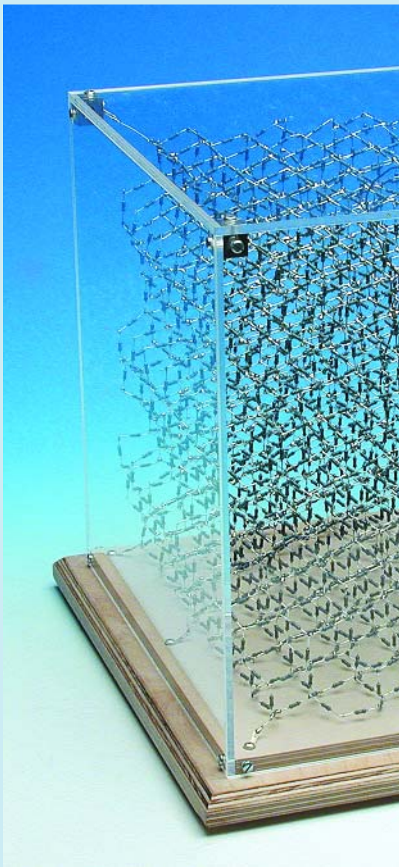
A square array of infinite size is built from identical resistors with the value R = 1 kΩ. What is the resistance measured along a single resistor as shown in the illustration? How is the measured value explained?

If you feel like solving the problem the practical way, simply start soldering away a few dozen resistors and perform a simple measurement in order to get an approximate answer. Alternatively, why not push the limits of your electronics simulation program? Note however that we're not satisfied with just the value, but also require a well-substantiated explanation, comprising as little mathematics as possible, please!

It is also possible to have a go at three-dimensional arrays like cubes (**Figure 2**). Have fun!

Supplementary question

If you are not convinced that your explanation with the value measured in Figure 1 makes sense or is as simple as possible, you have a second chance to participate and win in this quizz. In the cube shown in Figure 2, the resistors form a three-dimensional array resembling the crystal structure of a diamond.



The supplementary question is:

How many resistors is the cube made of?

AWAY

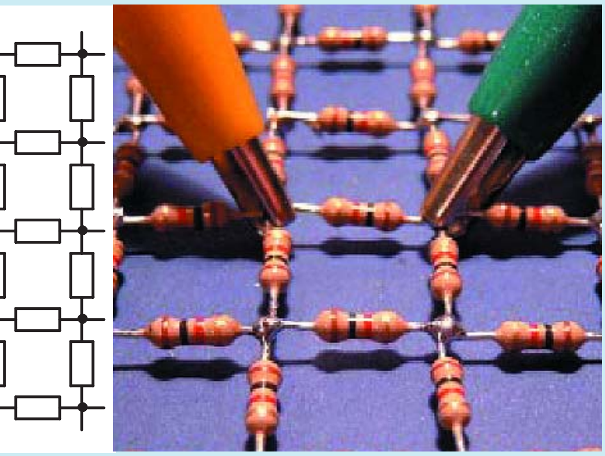
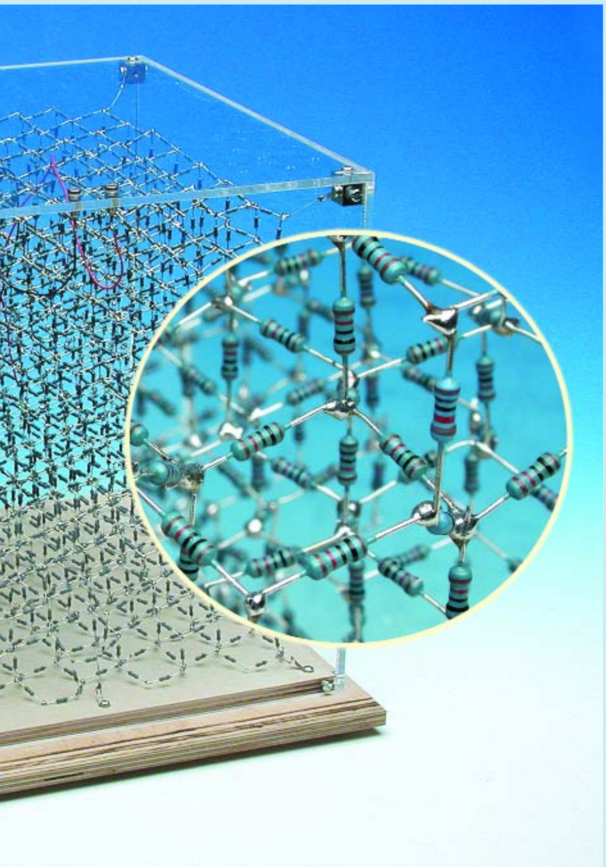


Figure 1. Infinite resistor array.

Figure 2. Ohsmann's Cube: a three-dimensional resistor array.



Quizz'away and win!

Send in the best answer to this month's Quizz'away question and win this **Voltcraft USB Oscilloscope** from **Conrad Electronics**, worth £135.

All answers are processed by Martin Ohsmann in co-operation with Elektor editorial staff. Results are not open to discussion or correspondence and a lucky winner is drawn in case of several correct answers.

Five participants with the correct (or best) answer are rewarded with a 128-MB Elektor Electronics USB Memory Stick.

Quizz'away conditions

Please send your answer to this month's Quizz'away problem, and/or the supplementary question by email, fax or letter to:
Quizz'away, Elektor Electronics, PO Box 190, Tunbridge Wells TN5 7WY, England. Fax (+44) (0)1580 200616. Email editor@elektor-electronics.co.uk, subject: 'quizzaway 09-04'.

The closing date is 24 September 2004*. The outcome of the quiz is final. The quiz is not open to employees of Segment b.v., its business partners and/or associated publishing houses.*